

The Dynamometer, a modern device ?

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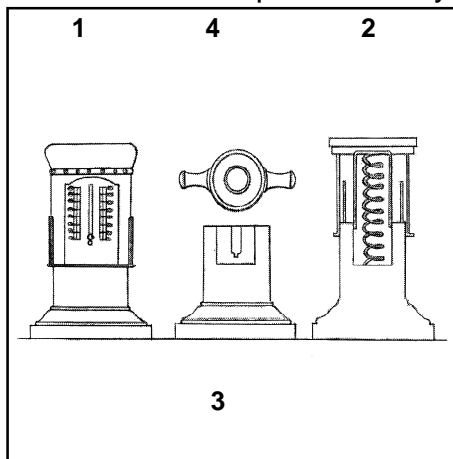
My training partner recently bought a state-of-the-art dynamometer, a modern invention for evaluating the strength of the hand and forearm and the progressive nature of muscular fatigue. Imagine his surprise when I produced a copy of "Defensive Exercises: Comprising Wrestling, Boxing" by Donald Walker, which was published in 1840.

I have copied the first chapter faithfully; hopefully readers will find it as interesting as I do. Remember it was published in 1840, the question is: how many years prior to publication was the dynamometer used?

PRELIMINARY REMARKS ON MEASURES OF FORCE

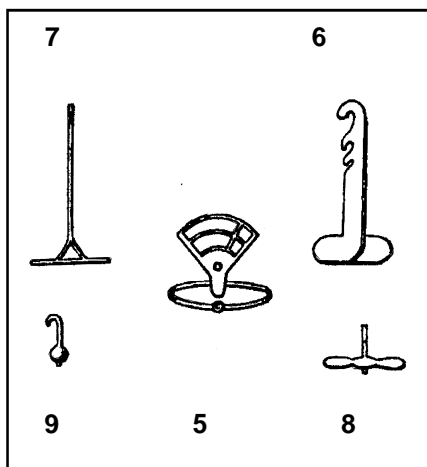
The instruments to measure force, are termed Dynamometers.

The Dynamometer of Repulsive Force is represented by



figures 1, 2, 3, 4.

Fig. 1, exhibits its external appearance, with a scale marking the weight moved; fig. 2, the interior spiral spring; fig. 3, the base or lower half, constructed of wood; and fig. 4, the handle used in pressing the instrument against the breast. A well-stuffed cushion, on the upper part of fig. 1, is intended to preserve the fist from injury in striking the instrument.



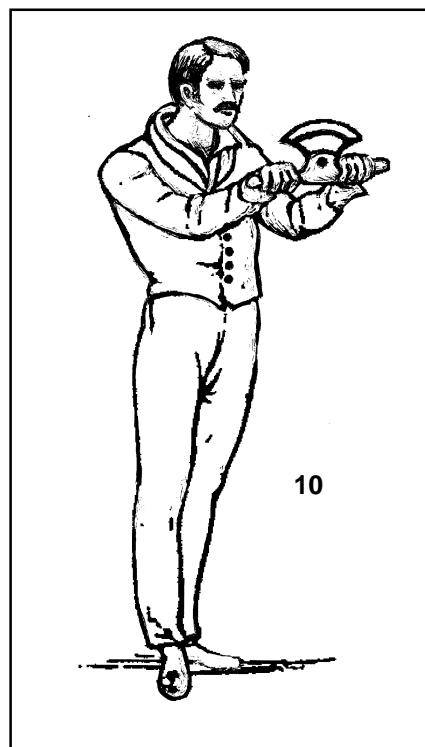
The dynamometer of Compressive Force is represented by figures 5, 6, 7, 8, 9.

Fig. 5, represents its front; fig. 6, a perspective view of the rack used to measure the strength of the loins; fig. 7, another view of the same; fig. 8, the hook necessary to bring the dynamometer towards the body; and fig. 9, another view of the same.

Dynamometers of compres-

sive and repulsive force should be kept in all gymnasia, for the purpose of testing the strength of the pupils.

In ascertaining the strength of the hands, the dynamometer of compressive power is grasped by them, and kept at first on a level with the hips, the hands being placed nearly in the middle of the instrument, and the fingers closed tightly, though not forcibly. From this position, the arm extended is raised as high as possible, and again lowered to the level of the shoulders, as shown in fig. 10, the fingers being then forcibly em-

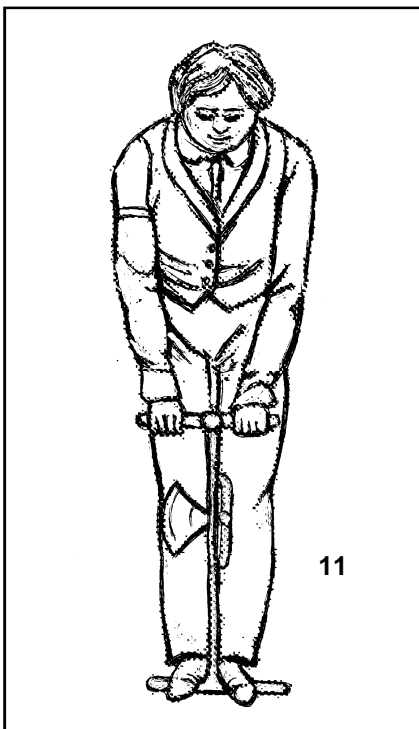


ployed so as to drive the index round the greater part of the circle, which exhibits the

power of each effort by pounds marked upon it.

This essay should be succeeded by trying the force of the loins by the same instrument, with a caution to the pupil not to overstrain himself; for the object in view is to teach him the proper use of his powers, and the means of hoarding and restraining them when their full exercise might be injurious. He must be taught, that however useful strength may be, it must always be regarded as of secondary importance in gymnastic exercises.

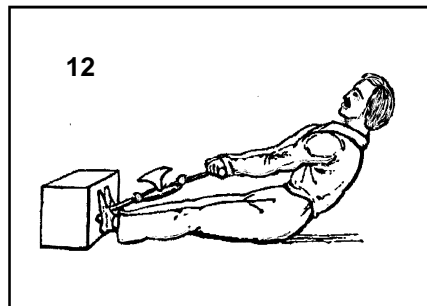
The strength of the loins can



be tested in two ways, either by supporting the body and loins against the wall or a strong door, or without any support whatever.

Fig. 11, exhibits a trial of the strength of the loins, in the middle of a room without any support to the back. Between

the legs is placed the rack, the feet being firmly placed on the flat branches of the stand, close to the support. The dynamometer is fastened by one of the extremities of the great axis to one of the notches, and the hook applied to the other extremity



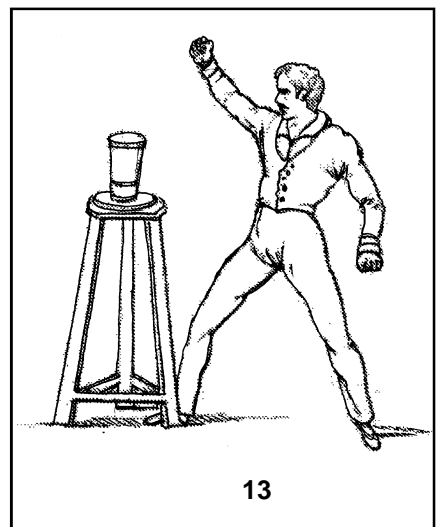
of the dynamometer, to raise or depress the instrument more or less, till it is so placed as to be most convenient for the effort and the raising of the arms, in order to produce the greatest possible effect.

The master who presides over this operation, will watch the muscles and veins of the pupil's neck, which must be uncovered; and when he perceives it to be too much swollen, or the face too red, he will order the pupil to cease: he then enquires the weight as shewn by the instrument, and enters it in his book.

The next step is to find the tractive power. This is done by making use of the dynamometer, as shewn in fig. 12. The pupil being seated on the ground, hooks the instrument to the beam, places his two feet against it, stretches his legs out, and draws the instrument towards him by means of the handle. This exercise is very

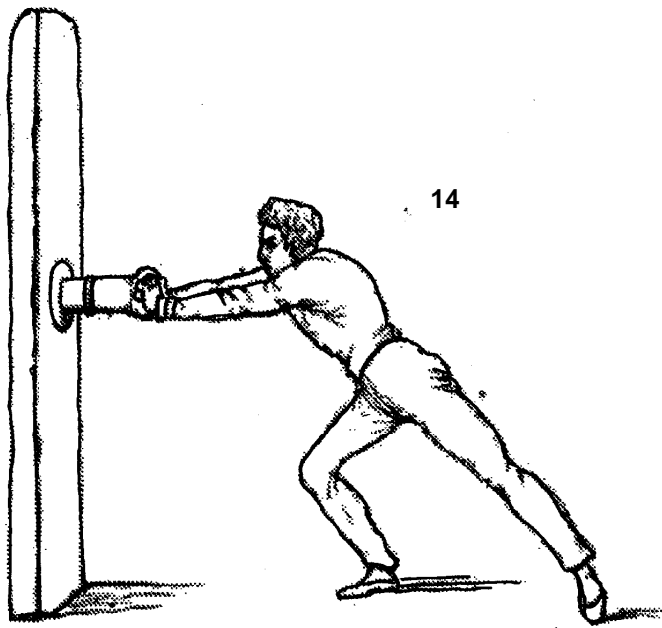
similar to the preceding; but the position is more convenient: the legs, by pushing horizontally against the beam, tend to increase the pressure, and generally a greater weight is marked. The teacher should observe the effect produced by this effort upon the neck and face, so as to stop the pupil at the proper time, as in the preceding exercise.

This should be succeeded by

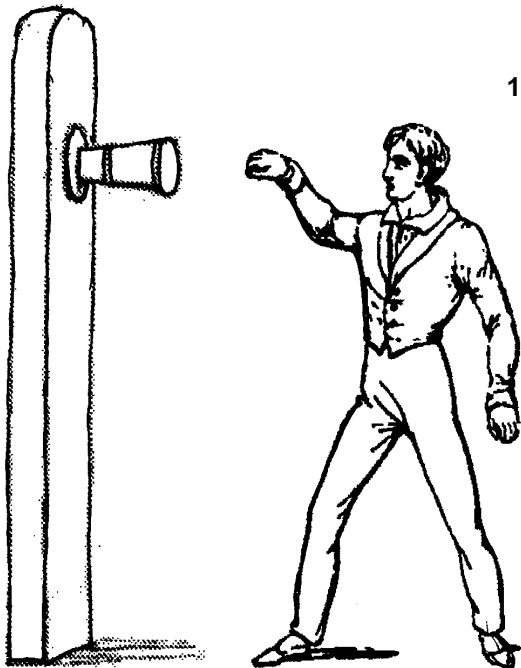


the fourth trial, or vertical blow with the right arm, exercised on the dynamometer of repulsive power.

Fig. 13, represents the action of striking against upper cushion of the instrument, with the fist firmly closed, and care taken to deliver the blow upon the middle or axis of the dynamometer; for the blow would be ineffective unless the spring received the full power of the arm, inasmuch as it would not yield sufficiently, and the result would be trifling. If a false blow has been given, it must be again tried, and the most successful noted. The vertical impulsive power of the

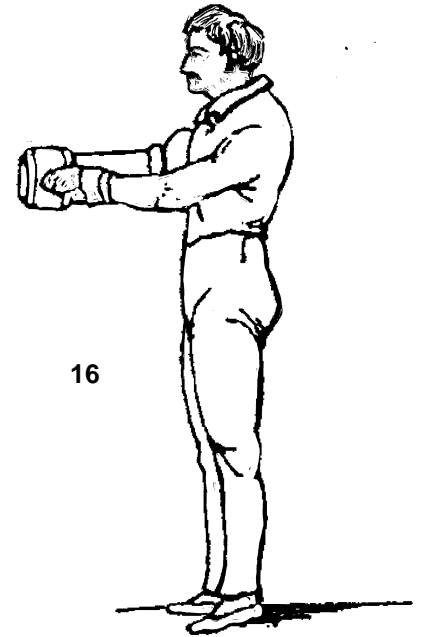


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weight moved is noted. Horizontal impulsion with the left is practiced in the same way. The power of pressure against the chest is tested by placing the same dynamometer between the chest and



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left arm is to be noted in the same way. Horizontal impulsion with both hands is practised by placing the dynamometer or repelling power in advance, as shewn in fig. 14. The in-

strument is pushed with the two fists, or the hands locked together, and the effect produced is entered as before. Horizontal impulsion with the right fist is practiced as represented in fig. 15, and the

the hands in the position shewn in fig. 16. This pressure is most conveniently practised by means of the double handle, but can be exercised by the hands if the handle be wanting. When children are young, and their arms not sufficiently long to go round the dynamometer and cross hands, they may be instructed to seize the ends of a handkerchief passed over the extremity, and thus draw the moveable part of the instrument towards them.

The End